

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



26 JAN 2005

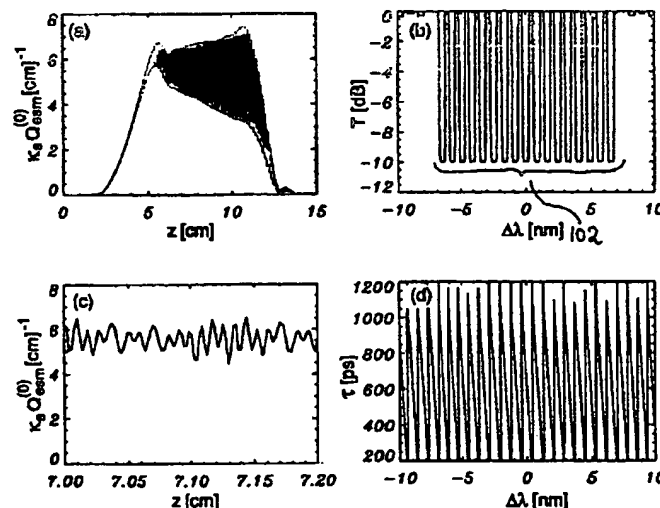
(43) International Publication Date
5 February 2004 (05.02.2004)

PCT

(10) International Publication Number
WO 2004/011980 A1

- (51) International Patent Classification⁷: G02B 6/34, H04J 14/02
- (21) International Application Number: PCT/AU2003/000959
- (22) International Filing Date: 30 July 2003 (30.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 2002950462 30 July 2002 (30.07.2002) AU
- (71) Applicant (for all designated States except US): RED-FERN OPTICAL COMPONENTS PTY LTD [AU/AU]; Suite 212, National Innovation Centre, Australian Technology Park, Eveleigh, New South Wales 1430 (AU).
- (72) Inventor; and
(75) Inventor/Applicant (for US only): BURYAK, Alexander [AU/AU]; 53 Coronga Crescent, Killara, New South Wales 2071 (AU).
- (74) Agent: FREEHILLS CARTER SMITH BEADLE; Level 32, MLC Centre, 19-29 Martin Place, Sydney, New South Wales 2000 (AU).
- (81) Designated States (national): AU, CA, JP, KR, US.
- (84) Designated States (regional): European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR).
- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: IMPROVED MULTI-CHANNEL GRATING DESIGN TECHNIQUE



(57) Abstract: A method of improving a grating design function describing a refractive index variation defining a multi-channel grating structure in a waveguide material, the improvement being a reduced maximum refractive index variation in the waveguide material along the grating structure while maintaining a desired functional spectral domain in a spectral response function associated with the design function, the method comprising the steps of modifying a first design function to generate a second design function having a reduced maximum amplitude compared with the first design function, determining a second response function associated with the second design function, modifying the second response function to create a third response function having a desired functional spectral domain, and determining a third design function associated with the third response function, and iterating the method steps until the desired improvement is achieved, wherein the third design function of the previous iteration takes the place of the first design function of the next.

WO 2004/011980 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU03/00959

A. CLASSIFICATION OF SUBJECT MATTER		
Int. Cl. ⁷ : G02B 6/34, H04J 14/02		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Results of the Art. 15(5) search on AU 2002950462 for the same invention		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
USPTO, ESPACENET, DWPI: grating, multichannel, multi-channel, design, sinc, bragg, filter, wdm, dwdm, et cetera		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E, A	US 6445852 B1 (FECED et al.) 3 September 2002 Whole document	
A	BURYAK et al., "Novel multi-channel grating designs", Proceedings of Bragg Gratings, Photosensitivity, and Poling in Glass Waveguides, Vol. 60 of Top Series, OSA, Washington, D.C., Paper BThB3, 2001	
A	US 6345135 B1 (REID et al.) 5 February 2002 Whole document	
<input type="checkbox"/> Further documents are listed in the continuation of Box C <input type="checkbox"/> See patent family annex		
<p>* Special categories of cited documents:</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier application or patent but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</p> <p>"&" document member of the same patent family</p>		
Date of the actual completion of the international search 8 August 2003		Date of mailing of the international search report 19 AUG 2003
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929		Authorized officer RAJEEV DESHMUKH Telephone No : (02) 6283 2145

INTERNATIONAL SEARCH REPORT

International application No.
PCT/AU03/00959

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
	US 6317539 B1 (LOH et al.) 13 November 2001	
A	Whole document	
	WO 99/22255 A1 (UNIVERSITY OF SOUTHAMPTON) 6 May 1999	
A	Whole document	
	WO 96/24079 A1 (THE UNIVERSITY OF SYDNEY) 8 August 1996	
A	Whole document	
	WO 02/075408 A1 (REDFERN OPTICAL COMPONENTS PTY LTD) 26 September 2002	
E,A	Whole document	
	WO 02/069006 A1 (REDFERN OPTICAL COMPONENTS PTY LTD) 6 September 2002	
E,A	Whole document	
T	BURYAK et al., "Optimization of refractive index sampling for multichannel fiber Bragg gratings", January 2003 (in press) [Retrieved from the Internet on 10 December 2002] http://www.redferncomponents.com.au/wpaper_roc.htm	

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/AU03/00959

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member			
US	6445852	NONE			
US	6345135	EP	955558	GB	2337135
US	6317539	NONE			
WO	9922255	AU	95516/98	BR	9813265
		EP	1032854	NZ	503975
WO	9624079	AU	45317/96	CA	2211834
		US	6081640	EP	807271
WO	2002075408	AU	20013789		
WO	2002069006	AU	20013359		
					END OF ANNEX